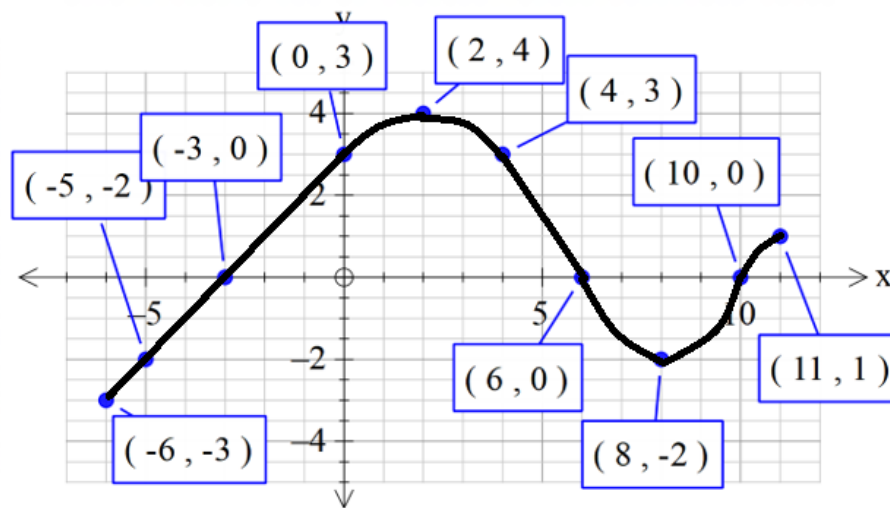


3.2 The Graph of a Function

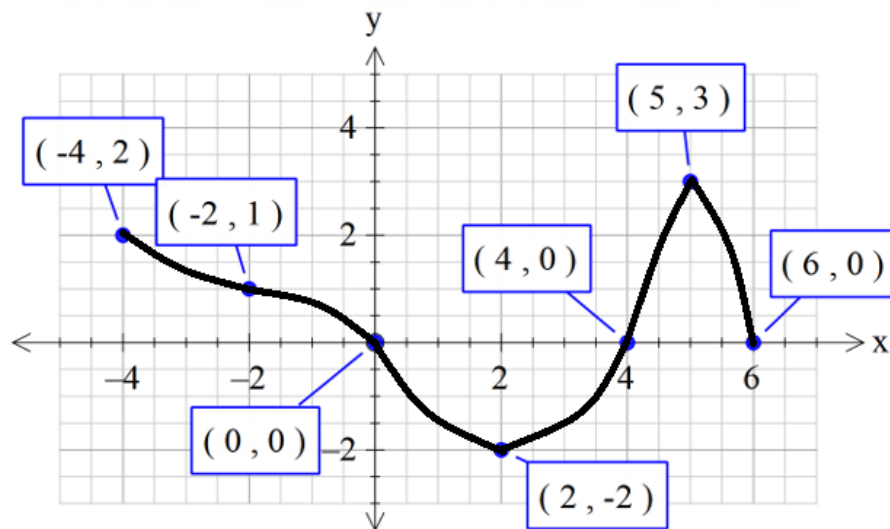
Name _____ Date _____ Period _____

1. A set of points in the xy -plane is the graph of a function if and only if every _____ line intersects the graph in at most one point.
2. If the point $(-1, 3)$ is a point on the graph of f , then $f(\text{_____}) = \text{_____}$.
3. Find a so that the point $(-2, 5)$ is on the graph of $f(x) = ax^2 + 4$.
4. **True or False** A function can have more than one y -intercept.
5. **True or False** The graph of a function $y = f(x)$ always crosses the y -axis.
6. Use the graph of the given function f to answer parts (a)-(n).



- (a) Find $f(0)$ and $f(-6)$.
- (b) Find $f(6)$ and $f(11)$.
- (c) Is $f(3)$ positive or negative?
- (d) Is $f(-4)$ positive or negative?
- (e) For what values of x is $f(x) = 0$?
- (f) For what values of x is $f(x) > 0$?
- (g) What is the domain of f ?
- (h) What is the range of f ?
- (i) What are the x -intercepts?
- (j) What is the y -intercept?
- (k) How often does the line $y = \frac{1}{2}$ intersect the graph?
- (l) How often does the line $x = 5$ intersect the graph?
- (m) For what values of x does $f(x) = 3$?
- (n) For what values of x does $f(x) = -2$?

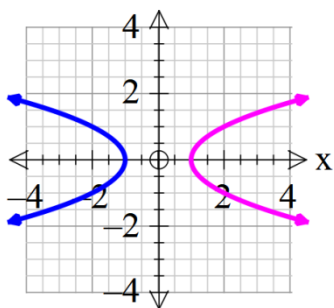
7. Use the graph of the given function f to answer parts (a)-(n).



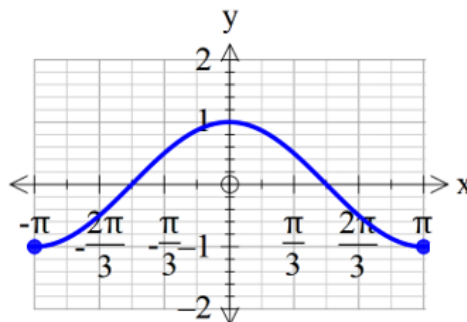
- (a) Find $f(0)$ and $f(6)$. (b) Find $f(2)$ and $f(-2)$. (c) Is $f(3)$ positive or negative?
- (d) Is $f(-1)$ positive or negative? (e) For what values of x is $f(x) = 0$? (f) For what values of x is $f(x) < 0$?
- (g) What is the domain of f ? (h) What is the range of f ? (i) What are the x -intercepts?
- (j) What is the y -intercept? (k) How often does the line $y = -1$ intersect the graph?
- (l) How often does the line $x = 1$ intersect the graph? (m) For what values of x does $f(x) = 3$?
- (n) For what values of x does $f(x) = -2$?

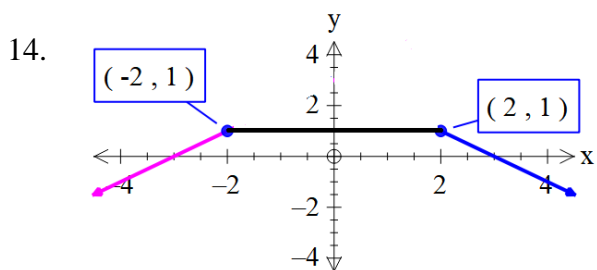
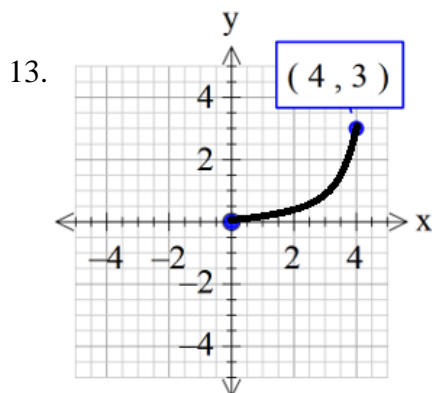
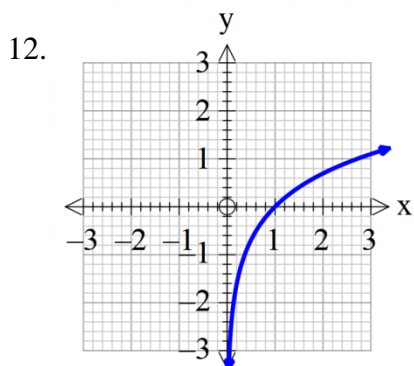
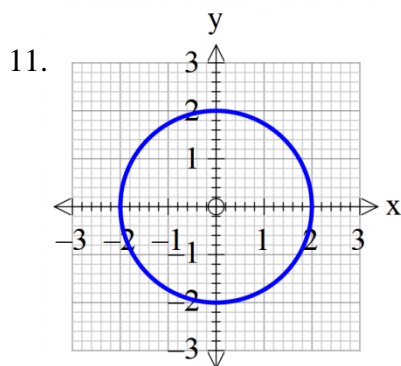
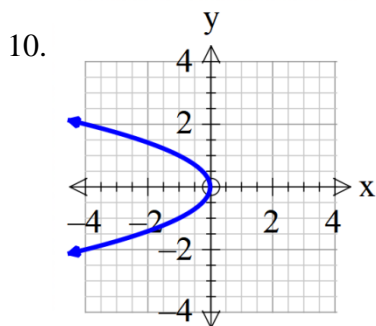
In problems 8-14 determine whether the graph is that of a function by using the vertical-line test. If it is, use the graph to find: a) the domain and range, b) the intercepts, if any, c) Any symmetry with respect to the x -axis, the y -axis or the origin.

8.



9.





In the problems below, answer the questions about the given function.

15. $f(x) = 2x^2 - x - 1$

a) Is the point $(-1, 2)$ on the graph of f ?

b) If $x = -2$, what is $f(x)$? What point is on the graph of f ?

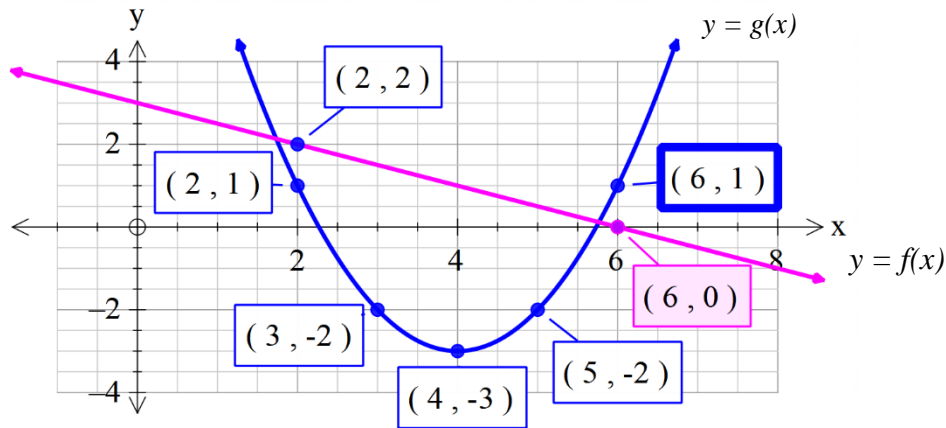
c) If $f(x) = -1$, what is x ? What point(s) are on the graph of f ?

16. $f(x) = \frac{x+2}{x-6}$

- Is the point $(3, 14)$ on the graph of f ?
- If $x = 4$, what is $f(x)$? What point is on the graph of f ?
- If $f(x) = 2$, what is x ? What point(s) are on the graph of f ?
- What is the domain of f ?
- List the x -intercepts, if any, of the graph of f .
- List the y -intercept, if there is one, of the graph of f .

The graph of two functions f and g , is illustrated below. Use the graph to answer parts (a)-(f).

17.



- $(f + g)(2)$
- $(f + g)(4)$
- $(f - g)(6)$
- $(g - f)(6)$
- $(f \cdot g)(2)$
- $\left(\frac{f}{g}\right)(4)$

18. A golf ball is hit with an initial velocity of 135 feet per second at an inclination of 45° to the horizontal. In physics, it is established that the height h of the golf ball is given by the function

$h(x) = \frac{-32x^2}{135^2} + x$ where x is the horizontal distance that the golf ball has traveled.

a) Determine the height of the golf ball after it has traveled 150 feet, 350 feet, and 550 feet.

b) How far was the golf ball hit?

c) Using a graphing calculator, graph the function $h = h(x)$.

d) How far has the ball traveled when it reaches its maximum height? What is its maximum height?